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COUPLING OF NURBS PATCHES WITH THE ISOGEOMETRIC DUAL MORTAR METHOD

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The integration of design and analysis is fostered by isogeometric analysis. The geometry description of the CAD system is also used for the numerical analysis, commonly using the finite element method (FEM). In most cases Non-Uniform Rational B-splines (NURBS) surfaces are used due to their prevalence in CAD software. But this entails the need for a coupling method for non-conforming patches in order to avoid unnecessary refinement for complex multi-patch models. The mortar method as proposed in [1] for standard FEM allows a coupling which requires neither additional variables nor empirical parameters. An isogeometric version of this method has been proposed in [2]. Basing on this, a more efficient dual mortar method with local support along the interfaces has been proposed in [3]. Using an improved class of dual basis functions, in this contribution a dual mortar method with completely decoupled interfaces is presented. This yields improved sparsity patterns and condition numbers of the global stiffness matrix in comparison to [3]. The effect on the efficiency of the computations and the accuracy of the solution is shown by means of numerical examples. Computations with the proposed method are competitive to standard conforming computations in terms of accuracy and efficiency.

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